

## New Distributional Records of the Mycoheterotrophic *Sciaphila alba* (Triuridaceae), outside the Type Locality

KENJI SUETSUGU<sup>1,\*</sup>, AKIYO NAIKI<sup>2</sup>, YAYOI TAKEUCHI<sup>3</sup>, HIRONORI TOYAMA<sup>4</sup>,  
SHUICHIRO TAGANE<sup>4</sup> AND TETSUKAZU YAHARA<sup>4</sup>

<sup>1</sup>Department of Biology, Graduate School of Science, Kobe University, 1-1 Rokkodai, Nada-ku, Kobe, 657-8501, Japan. \*kenji.suetsugu@gmail.com (author for correspondence); <sup>2</sup>Iriomote Station, Tropical Biosphere Research Center, University of the Ryukyus, 870 Uehara, Taketomi-cho, Yaeyama-gun, Okinawa 907-1541, Japan; <sup>3</sup>Center for Environmental Biology and Ecosystem Studies, National Institute for Environmental Studies, Tsukuba, Ibaraki 305-8506, Japan; <sup>4</sup>Center for Asian Conservation Ecology, Kyushu University, 744, Motoooka, Fukuoka 819-0395, Japan

Two new localities of the mycoheterotrophic plant, *Sciaphila alba* (Triuridaceae), are reported and the description of its morphology, in particular on color polymorphism of staminate flowers, based on a new collection from Tatau, Sarawak and from herbarium studies at KYO is updated. *Sciaphila alba* had been reported only from Lambir Hills National Park, Sarawak, Borneo.

Key words: *Sciaphila*, new locality, mycoheterotroph, Triuridaceae

The mycoheterotrophic genus *Sciaphila* Blume consists of ca. 40 species and is the largest group within the family Triuridaceae Gardner (van de Meerendonk 1984). As with most other mycoheterotrophs, they are very small in size, up to 40 cm, recognizable only during its reproductive season and usually in a small population. Consequently, they have been collected infrequently and their morphology has rarely been described in detail.

In taxonomic studies of *Sciaphila* (van de Meerendonk 1984, Tsukaya & Okada 2013, Tsukaya & Suetsugu 2014, Suetsugu *et al.* 2016), sexuality of the plants, number and shape of the stamens and tepals, apex of the tepals, and shape and length of the style have been used as key characters for species discrimination. Key characteristics of the staminate flowers are often limited, however, because most specimens have only immature flowers, making species identity difficult (Tsukaya & Okada 2013, Tsukaya & Suetsugu

2014). Because of such difficulties, the taxonomy of *Sciaphila* is in need of revision.

During our recent field survey in Bintulu District, Sarawak, Malaysia, and an investigation of specimens at KYO, we found two new localities of *Sciaphila alba*, which was previously considered to be endemic to Lambir Hills National Park, Sarawak (Tsukaya & Suetsugu 2014). Here we report new localities for *S. alba* and update a description of its morphology, in particular on the color polymorphism of staminate flowers.

***Sciaphila alba*** Tsukaya & Suetsugu, Phytotaxa 170: 284 (2014). — Fig. 1

*Specimen examined*: BRUNEI. Seria District, Teraja Forest Reserve, 18 Dec. 1963, *M. Hotta 12710* (KYO); MALAYSIA. Sarawak State, Miri Division, Miri District, Lambir Hills National Park, along the Lambir Pantu trail, a forest dominated by species of Dipterocarpaceae, *K. Suetsugu s.n.* (holotype SAR, isotype KYO); MA-



LAYSIA. Sarawak State, Bintulu Division, Tatau District, Tatau, a water catchment forest of Rh. Sayong, a kerangas forest dominated by species of Dipterocarpaceae, 02°18'52.1"N, 112°56'07.4"E, alt. 105 m, 2 Feb. 2016, A. Naiki *et al.* SWK 1331 (OSA).

Herbs, mycoheterotrophic, monoecious, perennial, erect, ca. 25–35 cm tall, pale pinkish white, unbranched. Roots filiform, hairy. Stem glabrous, 0.5 mm thick. Inflorescence terminal, racemose, 8–14 cm long, with more than 20 flowers, internodes 3–10 mm long; pedicels 2.5–3.5 mm long in staminate flowers and 3–4 mm in carpellate flowers, branching from a stem at 90°, straight; bracts triangular lanceolate, 2 mm long, apex acute, appressed to pedicel. Flowers spirally arranged, unisexual, with staminate above carpellate flowers, glabrous. Staminate flowers: tepals 6(–8), pale pinkish white or reddish purple at base, fading to pale pinkish white at apex, equal in size, narrowly triangular, 2.5–3 mm long, 0.5 mm wide, fused basally, opening to a flat plane at base, apex obtuse, smooth, recurved; stamens (2 or) 3, sessile; anthers 2-locular, 0.5–0.7 mm long. Carpellate flowers: tepals 6(–8), pale pinkish-white, equal in size, triangular, 2.7 mm long, 0.7 mm wide, fused basally, apex obtuse or acute, smooth, recurved; ovaries more than 30 per flower, ca. 1 mm long; style and stigma club-shaped, papillate, laterally inserted at base of ovary, ca. 0.5 mm long.

**Note.** The unisexual flowers and staminate flowers with 6(–8) equal tepals of *Sciaphila alba* is characteristic of *Sciaphila* sect. *Oliganthera* subsect. *Quadrilobatae*. According to van de Meerendonk (1984), *S. alba* shares the three stamens of the staminate flowers with *S. corniculata* Baccari and *S. secundiflora* Thwaites ex Benth in subsection *Quadrilobatae*, but differs from those two species in having larger staminate flowers (ca. 7 mm in diameter for *S. alba* vs. less than 5 mm in diameter in *S. corniculata* and *S. secundiflora*). *Sciaphila alba* was described as being completely white, but the base of the staminate tepals in plants from the population newly discovered in Bintulu is purple (Fig. 1). Color polymorphism within the same species has been ob-

served in many mycoheterotrophic species (e.g. Fukunaga *et al.* 2008, Suetsugu 2012a,b, 2016a,b, Tsukaya & Okada 2012, Suetsugu & Yagame 2014), likely due to selective pressure for photoprotection pigments being relaxed in mycoheterotrophs.

**Distribution.** Brunei and, Malaysia [Sarawak, Bintulu, Miri (Lambir Hills National Park)].

*Sciaphila alba* was known only from Lambir Hills National Park, Sarawak, Borneo. Tsukaya & Suetsugu (2014) noted that *Sciaphila alba* probably occurs in Brunei, where field photographs of similar plants are shown on the website at <http://picasaweb.google.com/114624054343272890996>. As anticipated, we here report a specimen of *S. alba* collected in Brunei (Fig. 2). Further exploration is needed to elucidate the variation and distribution of *S. alba*.

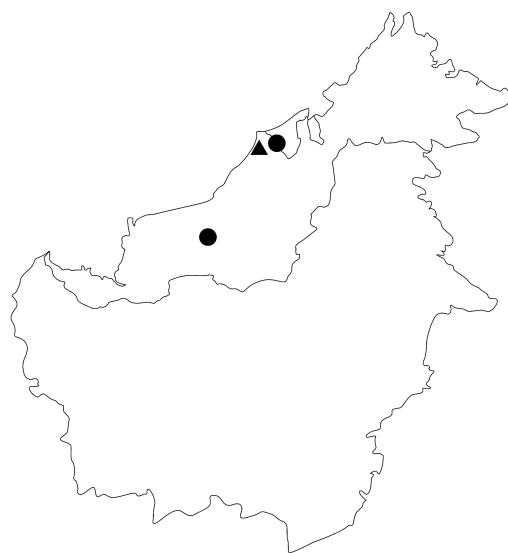


FIG. 2. Map showing distribution of *Sciaphila alba*. Triangle: Type locality of *S. alba*. Circles: New localities of *S. alba* reported here.

We thank Dr. Hidetoshi Nagamasu, curator of KYO for herbarium access. We also thank Mr. Engkamat anak Lading (Sarawak Forest Department), Mr. Julaihi Abdullah and Ms. Bibian Diway (Sarawak Forestry Corporation) for permission and assistance with field collections in Sarawak, Malaysia. This study was partly supported by the Environment Research and Technology Development

Fund (S9 & 4-1601) of the Ministry of the Environment, Japan, and by a grant-in-aid from the Japan Society for the Promotion of Science (15K18470 & 15H02640).

## References

- Fukunaga, H., S. Sawa & Y. Sawa. 2008. A new form of *Lecanorchis kiusiana*. Orchid Rev. 116: 106–108.
- van de Meerendonk, J.P.M. 1984. Triuridaceae. In: Steenis, C. G. G. J. van (ed.) Flora Malesiana ser. I, 10, pp. 109–121. Kulwer Academic Publishers, Dordrecht.
- Suetsugu, K. 2012a. A new form of *Gastrodia confusa* (Orchidaceae). J. Phytogeogr. Taxon. 59: 125–126.
- Suetsugu, K. 2012b. New record of the mycoheterotrophic orchid *Lecanorchis kiusiana* forma *lutea* outside the type locality. J. Phytogeogr. Taxon. 60: 35–37.
- Suetsugu, K. 2016a. A new color variant of the mycoheterotrophic orchid *Cyrtosia septentrionalis* from Hiroshima Prefecture, Japan. J. Jap. Bot. 91: 250–253.
- Suetsugu, K. 2016b. A new color variant of the mycoheterotrophic orchid *Gastrodia fontinalis* from Takeshima Island, Japan. Acta Phytotax. Geobot. 67: 55–59.
- Suetsugu, K., H. Tsukaya & H. Ohashi. 2016. *Sciaphila yakushimensis* (Triuridaceae), a new mycoheterotrophic plant from Yakushima Island, Japan. J. Jap. Bot. 91: 1–6.
- Suetsugu, K. & T. Yagame. 2014. Color variation of the mycoheterotrophic *Yoania japonica* (Orchidaceae). Acta Phytotax. Geobot. 65: 49–51.
- Tsukaya, H. & H. Okada. 2012. A color variation of *Epirixanthes* species (Polygalaceae) found in West Kalimantan, Borneo, Indonesia. Acta Phytotax. Geobot. 62: 95–97.
- Tsukaya, H. & H. Okada. 2013. A new species of *Sciaphila* Blume (Triuridaceae) from Kalimantan, Borneo, with a new record from Borneo. Syst. Bot. 38: 600–605.
- Tsukaya, H. & K. Suetsugu. 2014. Two new species of *Sciaphila* (Triuridaceae) from Sarawak (Borneo, Malaysia). Phytotaxa 170: 283–290.

Received December 5, 2016; accepted January 23, 2017

## Errata and Corrigenda

### ■ *Acta Phytotaxonomica et Geobotanica* 68 (2)

Kenji Suetsugu, Akiyo Naiki, Yayoi Takeuchi, Hironori Toyama, Shuichiro Tagane and Tetsukazu Yahara. 2017. New Distributional Records of the Mycoheterotrophic *Sciaphila alba* (Triuridaceae), outside the Type Locality. *Acta Phytotaxonomica et Geobotanica* 68 (2): 123–126.

'doi: 10.18942/apg.201614' should be replaced by 'doi: 10.18942/apg.201702.'